

What is claimed is:

1. A method of displaying a color video picture by sequentially displaying color images on a display device and switching illumination light colors depending  
5 on the displayed color images according to a field sequential process, said method comprising the steps of:

illuminating a display device having a matrix of pixels, with adjacent four pixels as a unit, with illuminating lights including a red illuminating light, a  
10 green illuminating light, a blue illuminating light, and an achromatic illuminating light, such that the illuminating lights applied to the pixels in each unit have different colors from each other and the colors of the illuminating lights are switched in each field  
15 period;

generating a red video signal, a green video signal, a blue video signal, and an achromatic video signal from a color video signal so as to correspond to the colors of the illuminating lights applied to the  
20 pixels in each unit; and

energizing said display device with the generated video signals to display a color video picture thereon.

25 2. A method according to claim 1, further comprising the step of:

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projecting the color video picture displayed  
on said display device.

3. A method according to claim 1, wherein the  
5 pixels in each unit are arranged in a square matrix with  
green and achromatic pixels positioned diagonally  
opposite in relation to each other.

4. A method according to claim 2, wherein the  
10 pixels in each unit are arranged in a square matrix with  
green and achromatic pixels positioned diagonally  
opposite in relation to each other.

5. An apparatus for displaying a color video  
15 picture by sequentially displaying color images on a  
display device and switching illumination light colors  
depending on the displayed color images according to a  
field sequential process, said apparatus comprising:

a display device having a matrix of pixels;  
20 color switching illumination means for  
illuminating said display device, with adjacent four  
pixels as a unit, with illuminating lights including a  
red illuminating light, a green illuminating light, a  
blue illuminating light, and an achromatic illuminating  
25 light, such that the illuminating lights applied to the  
pixels in each unit have different colors from each other

and the colors of the illuminating lights are switched in each field period; and

video signal processing means for generating a red video signal, a green video signal, a blue video signal, and an achromatic video signal from a color video signal so as to correspond to the colors of the illuminating lights applied to the pixels in each unit, and energizing said display device with the generated video signals to display a color video picture thereon.

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6. An apparatus according to claim 5, further comprising the step of:

projecting means for projecting the color video picture displayed on said display device.

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7. An apparatus according to claim 5, wherein said color switching illumination means comprises four regions for emitting said red illuminating light, said green illuminating light, said blue illuminating light, and said achromatic illuminating light to each pixel of said display device, with only one at a time of said four regions being energizable to emit the illuminating light in each field period.

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8. An apparatus according to claim 6, wherein said color switching illumination means comprises four

regions for emitting said red illuminating light, said  
green illuminating light, said blue illuminating light,  
and said achromatic illuminating light to each pixel of  
said display device, with only one at a time of said four  
5 regions being energizable to emit the illuminating light  
in each field period.

9. An apparatus according to claim 5, wherein  
said color switching illumination means comprises a  
10 region for emitting either one of said red illuminating  
light, said green illuminating light, said blue  
illuminating light, and said achromatic illuminating  
light to each pixel of said display device, with the  
color of said one illuminating light being switchable in  
15 each field period.

10. An apparatus according to claim 6, wherein  
said color switching illumination means comprises a  
region for emitting either one of said red illuminating  
20 light, said green illuminating light, said blue  
illuminating light, and said achromatic illuminating  
light to each pixel of said display device, with the  
color of said one illuminating light being switchable in  
each field period.

11. An apparatus according to claim 5, wherein  
said color switching illumination means comprises a  
region for emitting either one of said red illuminating  
light, said green illuminating light, said blue  
5 illuminating light, and said achromatic illuminating  
light to each pixel of said display device, and means for  
moving the relative position of said region and said  
display device by a distance corresponding to one pixel  
in each field period.

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12. An apparatus according to claim 6, wherein  
said color switching illumination means comprises a  
region for emitting either one of said red illuminating  
light, said green illuminating light, said blue  
15 illuminating light, and said achromatic illuminating  
light to each pixel of said display device, and means for  
moving the relative position of said region and said  
display device by a distance corresponding to one pixel  
in each field period.

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13. An apparatus for displaying a color video  
picture by sequentially displaying color images on a  
display device and switching illumination light colors  
depending on the displayed color images according to a  
25 field sequential process, said apparatus comprising:

a display device having a matrix of pixels and a condensing lens disposed on a surface thereof for applying illuminating light in association with every four pixels of said matrix;

5           color switching illumination means for applying illuminating lights including a red illuminating light, a green illuminating light, a blue illuminating light, and an achromatic illuminating light at different angles to said condensing lens, switching the colors of  
10 the illuminating lights in each field period, such that, with adjacent four pixels as a unit, the illuminating lights applied to the pixels in each unit have different colors from each other, and switching the colors of the illuminating lights in each field period; and

15           video signal processing means for generating a red video signal, a green video signal, a blue video signal, and an achromatic video signal from a color video signal so as to correspond to the colors of the illuminating lights applied to the pixels in each unit,  
20 and energizing said display device with the generated video signals to display a color video picture thereon.

14. An apparatus according to claim 13, further comprising the step of:

25           projecting means for projecting the color video picture displayed on said display device.

DETAILED DESCRIPTION

15. An apparatus according to claim 13, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
5 emitting said red illuminating light, said green  
illuminating light, said blue illuminating light, and  
said achromatic illuminating light, respectively, said  
color switching illumination means being arranged to  
energize either one at a time of said four regions to  
10 emit the illuminating light in each field period.

16. An apparatus according to claim 14, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
15 emitting said red illuminating light, said green  
illuminating light, said blue illuminating light, and  
said achromatic illuminating light, respectively, said  
color switching illumination means being arranged to  
energize either one at a time of said four regions to  
20 emit the illuminating light in each field period.

17. An apparatus according to claim 13, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
25 emitting said red illuminating light, said green  
illuminating light, said blue illuminating light, and

said achromatic illuminating light, respectively, said  
color switching illumination means being arranged to  
energize either one at a time of said four regions to  
emit the illuminating light in each field period, said  
5 regions being arranged in a matrix.

18. An apparatus according to claim 14, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
10 emitting said red illuminating light, said green  
illuminating light, said blue illuminating light, and  
said achromatic illuminating light, respectively, said  
color switching illumination means being arranged to  
energize either one at a time of said four regions to  
15 emit the illuminating light in each field period, said  
regions being arranged in a matrix.

19. An apparatus according to claim 13, wherein  
said color switching illumination means has a collimator  
20 lens associated with four regions for emitting either one  
at a time of said red illuminating light, said green  
illuminating light, said blue illuminating light, and  
said achromatic illuminating light, said color switching  
illumination means being arranged to switch the colors of  
25 the illuminating lights in each field period.

20. An apparatus according to claim 14, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
emitting either one at a time of said red illuminating  
5 light, said green illuminating light, said blue  
illuminating light, and said achromatic illuminating  
light, said color switching illumination means being  
arranged to switch the colors of the illuminating lights  
in each field period.

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21. An apparatus according to claim 13, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
emitting either one at a time of said red illuminating  
15 light, said green illuminating light, said blue  
illuminating light, and said achromatic illuminating  
light, said color switching illumination means being  
arranged to switch the colors of the illuminating lights  
in each field period, said regions being arranged in a  
20 matrix.

22. An apparatus according to claim 14, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
25 emitting either one at a time of said red illuminating  
light, said green illuminating light, said blue

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illuminating light, and said achromatic illuminating light, said color switching illumination means being arranged to switch the colors of the illuminating lights in each field period, said regions being arranged in a  
5 matrix.

23. An apparatus according to claim 13, wherein  
said color switching illumination means has a collimator  
lens associated with four sets of four regions for  
10 emitting either one at a time of said red illuminating  
light, said green illuminating light, said blue  
illuminating light, and said achromatic illuminating  
light, said color switching illumination means having  
means for moving the relative position of said collimator  
15 lens and said four regions by a distance corresponding to  
one light-emitting region in each field period.

24. An apparatus according to claim 14, wherein  
said color switching illumination means has a collimator  
20 lens associated with four sets of four regions for  
emitting either one at a time of said red illuminating  
light, said green illuminating light, said blue  
illuminating light, and said achromatic illuminating  
light, said color switching illumination means having  
25 means for moving the relative position of said collimator

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OCTOBER 1986

lens and said four regions by a distance corresponding to one light-emitting region in each field period.

25. An apparatus according to claim 13, wherein  
5 said color switching illumination means has a collimator lens associated with four sets of four regions for emitting either one at a time of said red illuminating light, said green illuminating light, said blue illuminating light, and said achromatic illuminating  
10 light, said regions being arranged in a matrix, said color switching illumination means having means for moving the relative position of said collimator lens and said four regions by a distance corresponding to one light-emitting region in each field period.

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26. An apparatus according to claim 14, wherein  
said color switching illumination means has a collimator lens associated with four sets of four regions for emitting either one at a time of said red illuminating light, said green illuminating light, said blue illuminating light, and said achromatic illuminating  
20 light, said regions being arranged in a matrix, said color switching illumination means having means for moving the relative position of said collimator lens and  
25 said four regions by a distance corresponding to one light-emitting region in each field period.

27. An apparatus according to claim 13, wherein  
the pixels in each unit are arranged in a square matrix  
with green and achromatic pixels positioned diagonally  
5 opposite in relation to each other.

28. An apparatus according to claim 14, wherein  
the pixels in each unit are arranged in a square matrix  
with green and achromatic pixels positioned diagonally  
10 opposite in relation to each other.